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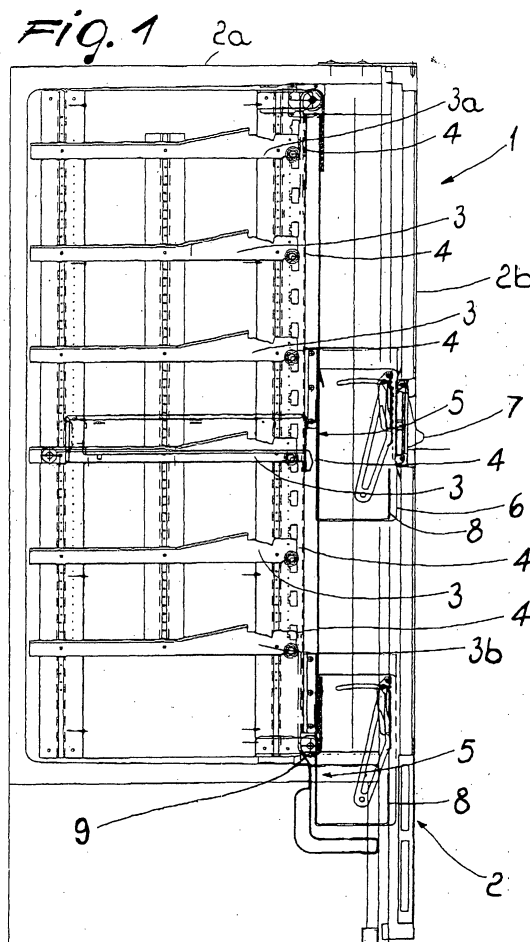
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(54) **Vending machine**

(57) A vending machine comprising an outer body provided with side walls and a front panel provided with means for accessing a removal region located inside said outer body, the vending machine further comprising a plurality of stacked shelves comprised between a lower shelf and an upper shelf, at least one compartment for each shelf, at least one exit device for a respective compartment designed to convey at least one product at an exit position, conveyance means designed to transfer said at least one product from said exit position to a removal position at said internal removal region, said access means being arranged at an intermediate portion between said lower shelf and said upper shelf.



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Description

[0001] The present invention relates to a vending machine.

[0002] Currently, vending machines for products such as for example beverages or food products in general often contain fragile products, which if dropped even from small heights tend to break or are otherwise subject to drawbacks of various kinds.

[0003] In order to obviate this drawback, vending machines have been proposed which are provided with means for moving the collection tray so as to allow such tray, following the selection of a product by the user, to be arranged at a product exit region and, after collecting the product, move to a withdrawal region that can be accessed from the outside of the body by way of access means located on the front panel of the vending machine.

[0004] In commercially available vending machines, the access means, such as for example a removal door, are arranged in a downward region with respect to the front panel.

[0005] Often the removal of the products from vending machines of this type is awkward and scarcely practical.

[0006] The aim of the present invention is to provide a new vending machine that allows the user a more comfortable and practical removal of the product than allowed by currently commercially available vending machines.

[0007] This aim and these and other objects that will become better apparent hereinafter are achieved by a vending machine comprising an outer body provided with side walls and a front panel provided with means for accessing a removal region located inside said outer body, the vending machine further comprising a plurality of stacked shelves comprised between a lower shelf and an upper shelf, at least one compartment for each shelf, at least one exit device for a respective compartment designed to convey at least one product at an exit position, conveyance means designed to transfer said at least one product from said exit position to a removal position at said internal removal region, characterized in that said access means are arranged at an intermediate portion between said lower shelf and said upper shelf.

[0008] Advantageously, a vending machine according to the invention is characterized in that said conveyance means are arranged between said front panel and said plurality of shelves.

[0009] Further characteristics and advantages of the invention will become better apparent from the following detailed description of some currently preferred embodiments thereof, given merely by way of non-limitative example, with reference to the accompanying drawings, wherein:

Figure 1 is a sectional view, taken along a substantially vertical plane that is perpendicular to the front

panel, of a vending machine according to the invention;

Figure 2 is a front view of a vending machine with some parts located inside the body shown in phantom lines;

Figure 3 is an enlarged-scale sectional view, similar to Figure 1, related to access means in the closure position;

Figure 4 is a sectional view, similar to Figure 3, but with the access means in a partially open position; and

Figure 5 is a sectional view, similar to Figures 3 and 4, but with the access means in a fully open position.

[0010] With reference to the figures, a vending machine according to the invention, generally designated by the reference numeral 1, is constituted by an outer body 2 constituted by side walls 2a and a front panel 2b.

[0011] The vending machine 1 has, inside the outer body 2, a plurality of shelves 3 that are mutually stacked and delimited in an upward region by an upper shelf 3a and in a downward region by a lower shelf 3b.

[0012] Each shelf has at least one compartment provided with at least one exit device, for example of the spiral or belt type, capable of causing the advancement of at least one product at a time chosen by the user at an exit position 4.

[0013] In particular, the vending machine 1 according to the invention has conveyance means 5 that are designed to transfer the products selected in each instance by the user from the respective exit position 4 to a removal position 6.

[0014] Said removal position 6 is located in the space between the front panel 2b and the plurality of shelves 3 and can be reached by the user by way of access means 7 located at the front panel 2b.

[0015] More particularly, the access means, for example a removal door, and accordingly the removal position 6, are located at a portion that is intermediate between the upper shelf 3a and the lower shelf 3b.

[0016] The conveyance means 5 are constituted by containment means 8 and by movement means 9.

[0017] As shown in the figures, the containment means are constituted by a tray or, in an equivalent manner, by a shelf that lies on a substantially horizontal plane and has, if necessary, lateral rims.

[0018] The movement means 9 are designed to allow the containment means to move along a substantially vertical direction during use.

[0019] More particularly, said means 9 can be constituted by toothed belts or continuous chains that lie along a substantially vertical direction and are adapted to support the containment means 8, advantageously at the respective longitudinal ends, by way of fixing means not shown, and move said containment means.

[0020] Conveniently, the movement means 9 are fixed, as shown more clearly in the figures, to said side walls; moreover, they might instead be fixed directly to

the front panel.

[0021] The vending machine 1 of course has actuation means, for example a reversible electric motor, which are not shown in the figures, for the movement of the means 9 and accordingly of the containment means 8.

[0022] Advantageously, the containment means 8 are adapted to move, by way of the action of the movement means, into a parking region designed to be occupied in the time between two successive product dispensing operations.

[0023] Conveniently, said parking region is arranged at the lower shelf, as shown in the figures, or above the upper shelf, so that the tray, usually constituted by a metal plate, does not prevent the user from seeing any products contained in the vending machine, particularly the ones located at the intermediate shelves.

[0024] Advantageously, for this purpose, the means 7 for accessing the internal removal region are made of an at least partially transparent material, such as for example Plexiglas or glass.

[0025] More particularly, the access means 9 comprise a first panel 9a that is designed to be pressed by the user during withdrawal; conveniently, said panel is loaded elastically outward, so as to return to the closed condition after the user has withdrawn the product from the containment means.

[0026] The means 9 are further constituted by a closure panel 9b that is suitable to prevent the user from accessing products arranged on the shelves.

[0027] Conveniently, both of said panels 9a and 9b can be angularly moved about an axis that is substantially horizontally and parallel to the front panel 2b.

[0028] The closure panel is arranged inside the outer body and is further rotationally supported by the containment means.

[0029] Advantageously, the access means have kinematic connection means, so that an angular movement of the first panel entails, during the first step of the opening thereof, a greater angular movement on the part of the closure panel.

[0030] More particularly, as shown more clearly in Figures 3 to 5, the kinematic connection means are constituted by at least one rocker 11 that is pivoted, by virtue of a respective pivot 12, to the containment means.

[0031] Said rocker has a pin 13 that is advantageously meant to slide inside a slot 14.

[0032] The closure panel 9b is rigidly coupled to a guide, constituted for example by a slot link 15, for said pin 13.

[0033] The kinematic connection means further comprise pusher means 16 that are rigidly coupled (or articulated) to the first panel and have at least one element, such as for example a wheel 17, that is suitable to slide along an abutment profile 18 arranged on the rocker.

[0034] Conveniently, the connection means comprise elastic means 19, such as for example a spring that acts between the rocker and the tray, which are meant to al-

low said means to return to the inactive position once the user has withdrawn the selected product.

[0035] Finally, the access means advantageously have a locking valve, which can be any of a mechanical, electromechanical or pneumatic valve, and is meant to allow the opening of the first panel exclusively if the containment means are in the removal region.

[0036] In practice it has been found that a vending machine according to the invention fully achieves the intended aim and objects.

[0037] The materials and the dimensions may be various according to requirements.

[0038] The disclosures in Utility Model Application No. VR2001U000054 from which this application claims priority are incorporated herein by reference.

[0039] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A vending machine comprising an outer body provided with side walls and a front panel provided with means for accessing a removal region located inside said outer body, the vending machine further comprising a plurality of stacked shelves comprised between a lower shelf and an upper shelf, at least one compartment for each shelf, at least one exit device for a respective compartment designed to convey at least one product at an exit position, conveyance means designed to transfer said at least one product from said exit position to a removal position at said internal removal region, **characterized in that** said access means are arranged at an intermediate portion between said lower shelf and said upper shelf.
2. The vending machine according to claim 1, **characterized in that** said conveyance means are arranged between said front panel and said plurality of shelves.
3. The vending machine according to claim 2, **characterized in that** said conveyance means are fixed to said side walls of said outer body.
4. The vending machine according to one or more of the preceding claims, **characterized in that** said access means are made of at least partially transparent material.
5. The vending machine according to one or more of the preceding claims, **characterized in that** said

conveyance means comprise movement means that are fixed to said side walls and containment means that can be moved by said movement means along a direction that is substantially vertical during use.

6. The vending machine according to claim 5, **characterized in that** said containment means comprise a tray.

7. The vending machine according to claim 5, **characterized in that** said containment means comprise a shelf that lies on a plane that is substantially horizontal during use.

8. The vending machine according to claim 6 or 7, **characterized in that** said tray or said shelf are made of at least partially transparent material.

9. The vending machine according to one or more of the preceding claims, **characterized in that** said movement means comprise at least one toothed belt that is articulated to said containment means.

10. The vending machine according to one or more of the preceding claims, **characterized in that** said movement means comprise at least one chain.

11. The vending machine according to one or more of the preceding claims, **characterized in that** said conveyance means comprise an actuation motor that is suitable to move said movement means.

12. The vending machine according to one or more of the preceding claims, **characterized in that** it comprises a parking region that is meant to be occupied by said containment means between two successive dispensing operations.

13. The vending machine according to one or more of the preceding claims, **characterized in that** said parking region is located between said front panel and said lower shelf.

14. The vending machine according to one or more of the preceding claims, **characterized in that** said parking region is located between said front panel and said upper shelf.

15. The vending machine according to one or more of the preceding claims, **characterized in that** said access means comprise a first panel, which is designed to pass, when pushed by the user, from an inactive position, in which said first panel closes said front panel, to a withdrawal position, and a closure panel arranged inside said outer body, said first panel and said closure panel being angularly movable about a respective axis that is substantially

horizontal and parallel to said front panel, and means for kinematic connection between said first panel and said closure panel which allow an angular movement of said closure panel that is different from the angular movement of said first panel.

16. The vending machine according to claim 15, **characterized in that** said closure panel is rotationally coupled to said containment means.

17. The vending machine according to one or more of the preceding claims, **characterized in that** said angular movement of said first panel comprises a first opening step and a second opening step, an angular movement of said first panel in said first step being matched by a greater angular movement of said closure panel.

18. The vending machine according to one or more of the preceding claims, **characterized in that** said kinematic connection means comprise at least one rocker provided with a pin, a guide for said pin that is rigidly coupled to said closure panel, and pusher means for said rocker that are rigidly coupled or articulated to said first panel.

19. The vending machine according to one or more of the preceding claims, **characterized in that** said guide comprises a slot link.

20. The vending machine according to one or more of the preceding claims, **characterized in that** said containment means comprise at least one slot in which said pin can slide.

21. The vending machine according to one or more of the preceding claims, **characterized in that** said at least one rocker is pivoted to said containment means.

22. The vending machine according to one or more of the preceding claims, **characterized in that** said at least one rocker comprises an abutment profile for said pusher means.

23. The vending machine according to one or more of the preceding claims, **characterized in that** said pusher means comprise at least one element that is suitable to slide along said abutment profile.

24. The vending machine according to one or more of the preceding claims, **characterized in that** said element is a freely rotating wheel.

25. The vending machine according to one or more of the preceding claims, **characterized in that** said kinematic connection means comprise elastic means for return to the inactive position.

26. The vending machine according to one or more of the preceding claims, **characterized in that** said access means comprise a locking device that is suitable to prevent the angular movement of said first panel if said containment means are not located at said removal region. 5
27. The vending machine according to one or more of the preceding claims, **characterized in that** said first panel and said closure panel are made of at least partially transparent material. 10
28. The vending machine according to one or more of the preceding claims, **characterized in that** said at least one exit device comprises a spiral. 15
29. The vending machine according to one or more of the preceding claims 1 - 27, **characterized in that** said at least one exit device comprises a sliding belt. 20

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Fig. 1 2a

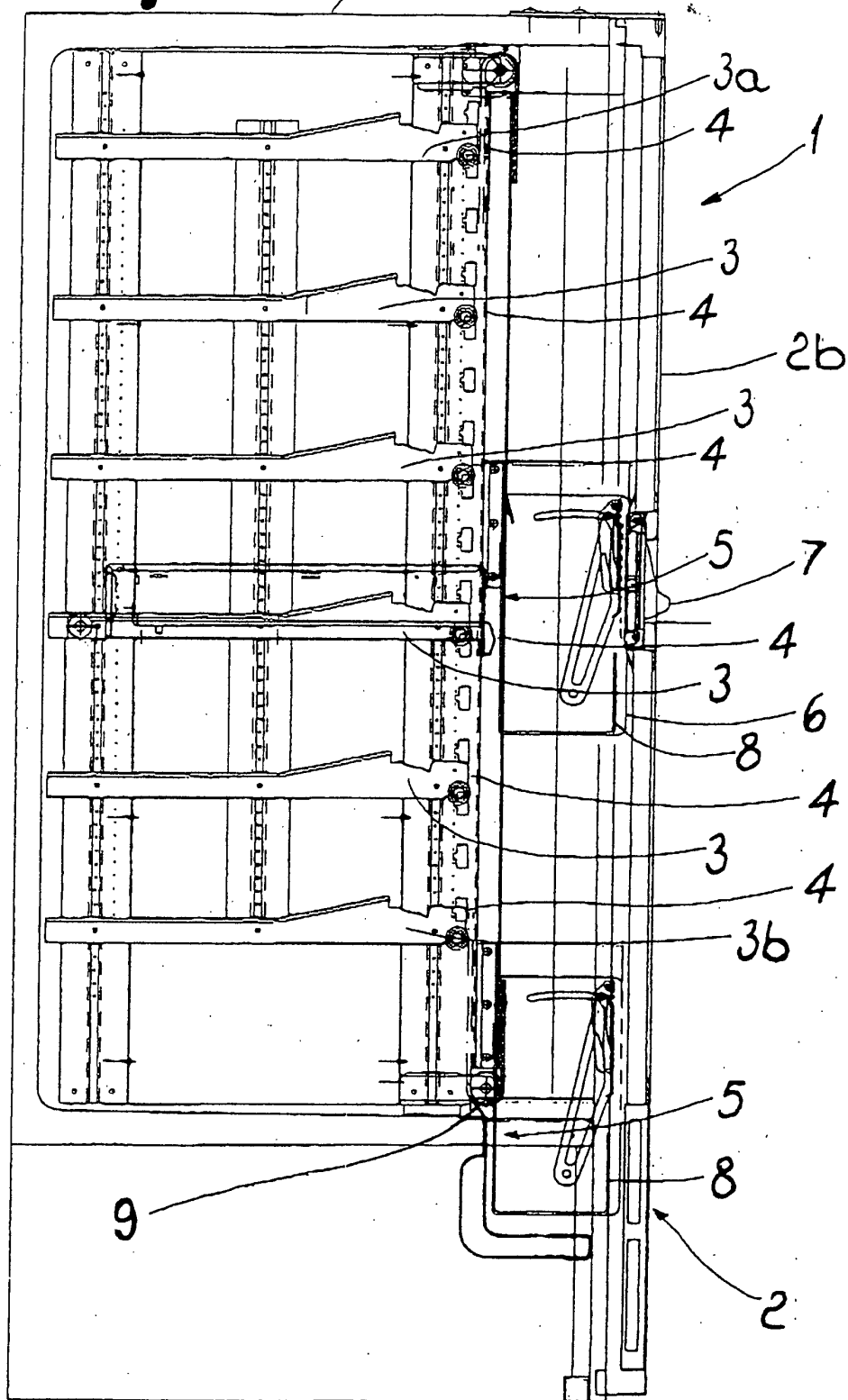


Fig. 2

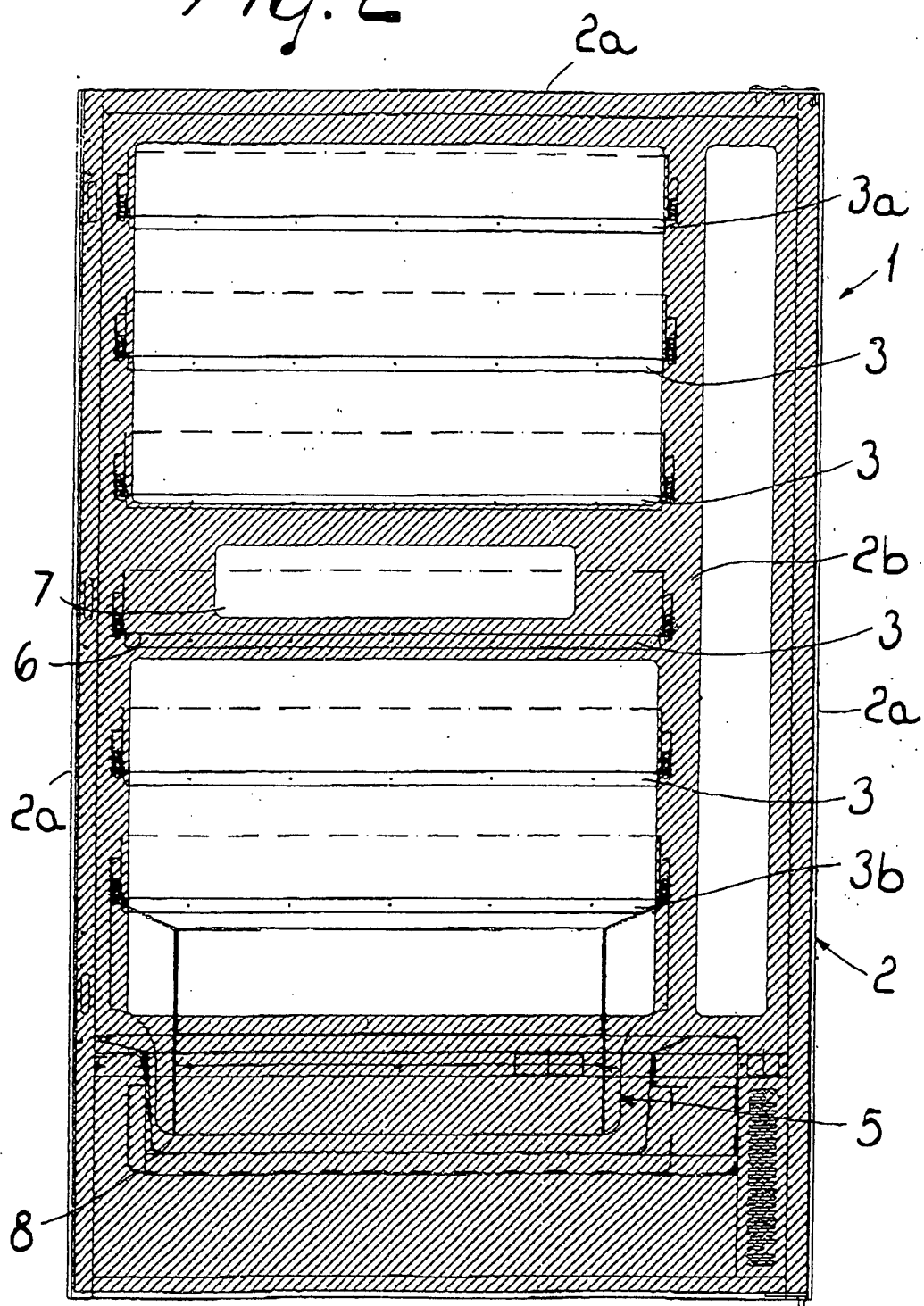


Fig. 3

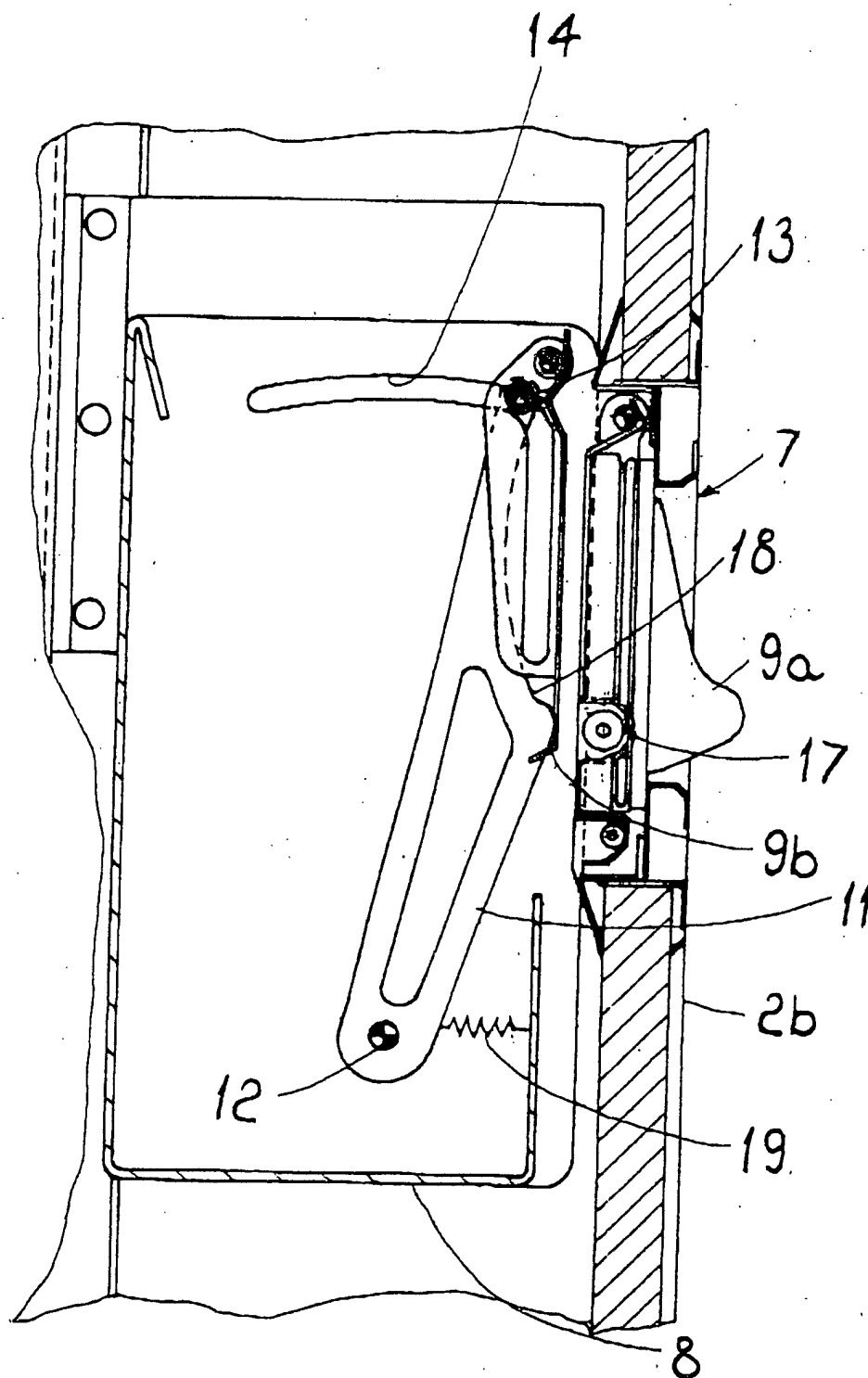
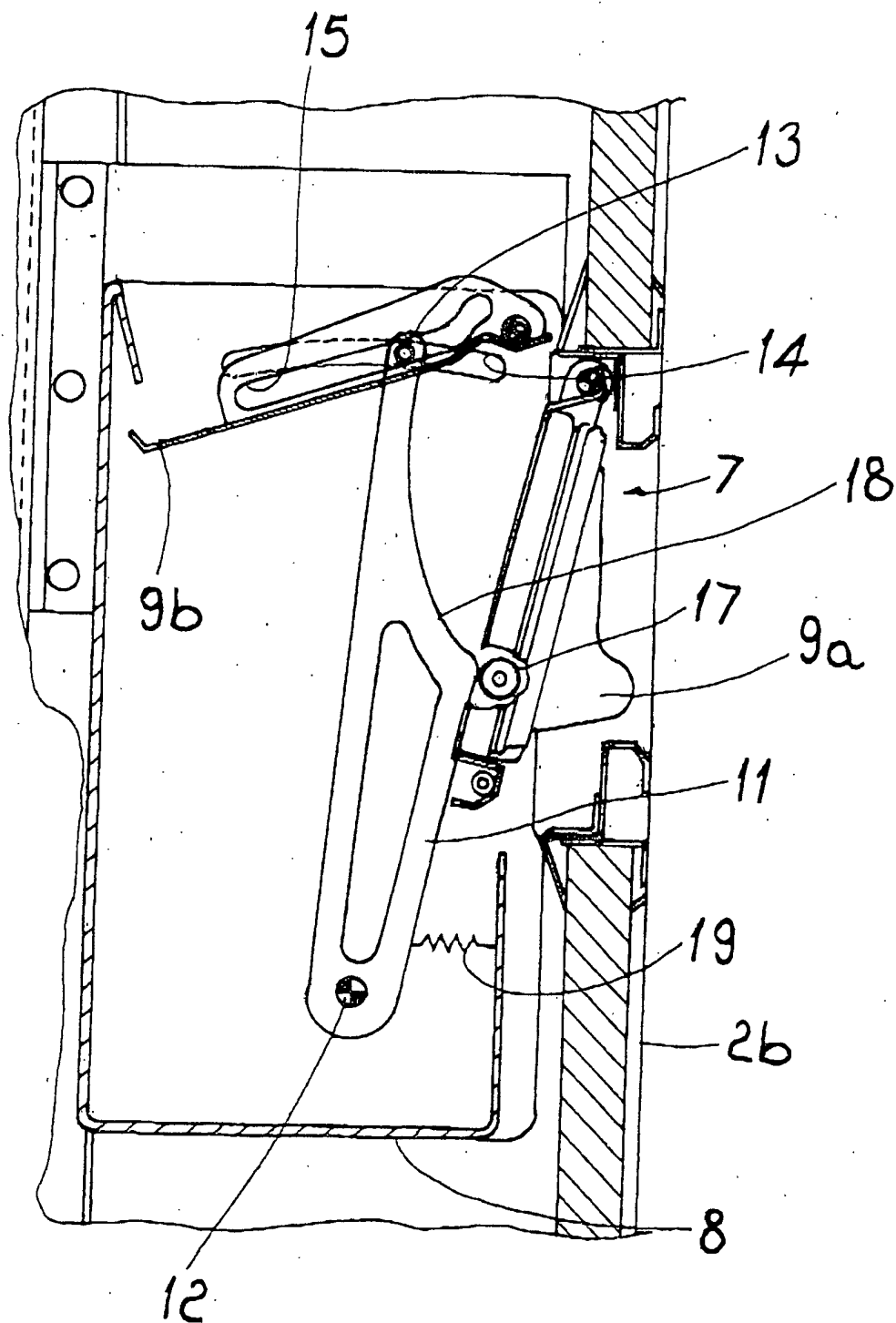


Fig. 4



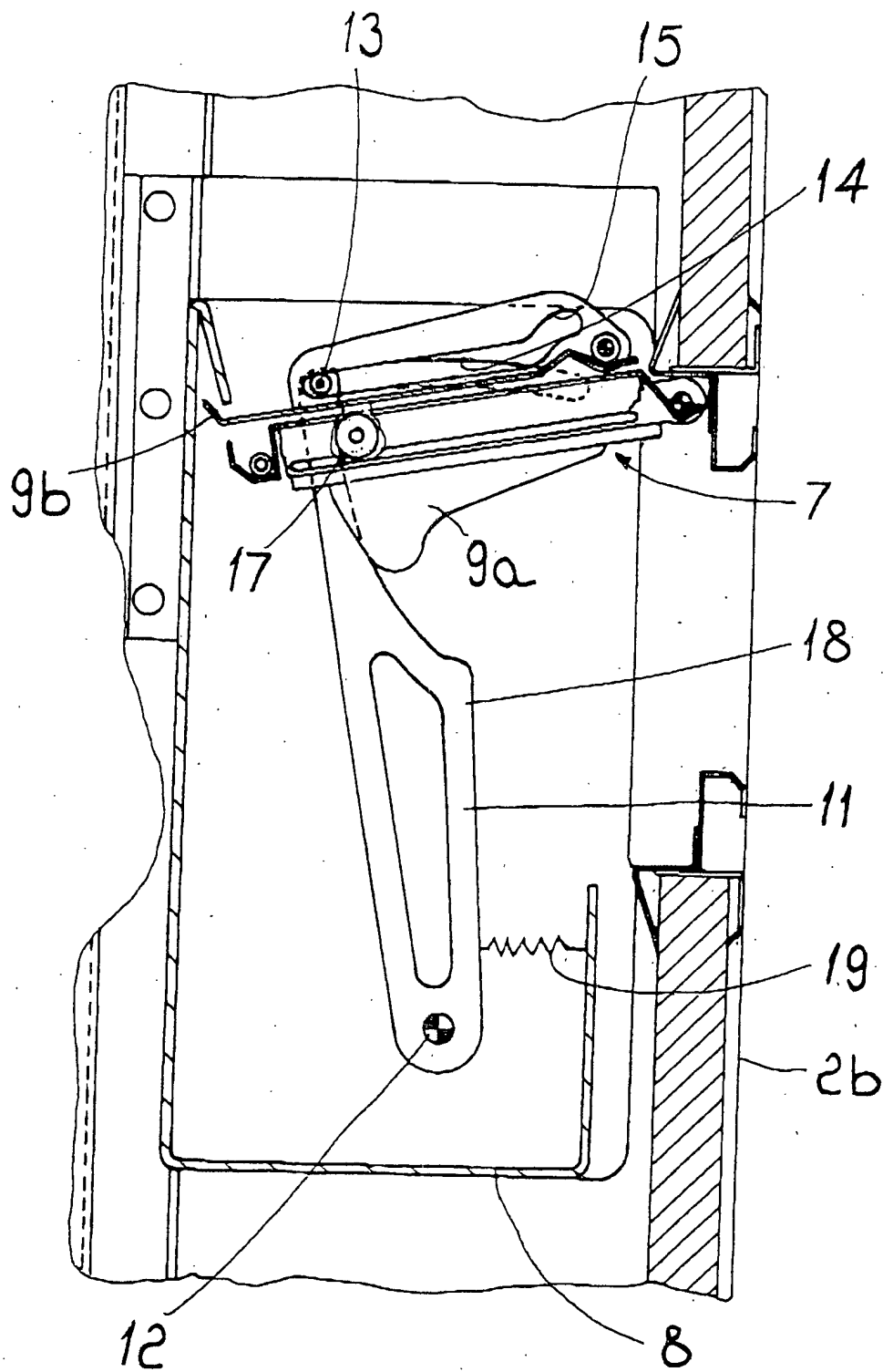


Fig. 5